THE

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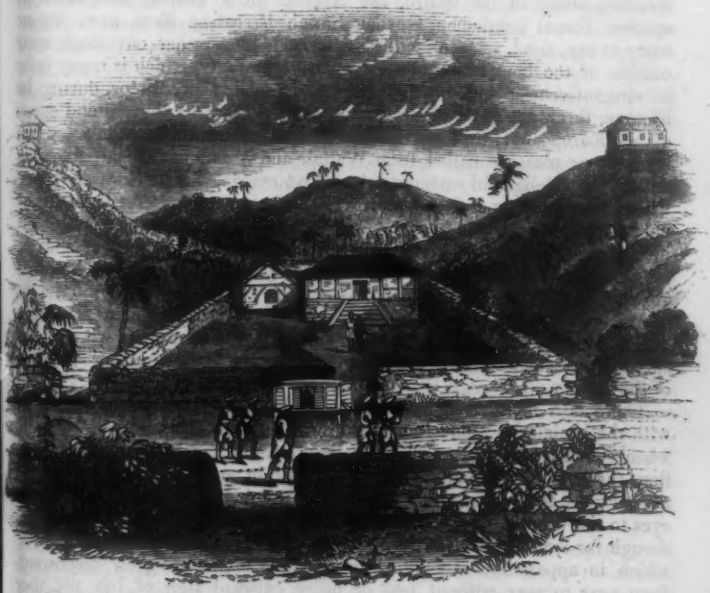
WATTAIR—THE HEAD-QUARTERS OF VIZAGAPATAM.



WATTAIR.

ABOUT an hour and a half's ride or drive brings the traveller from Vizagapatam to Wattair. The road is a gradual ascent, and on first leaving the fort-gates leads through an extensive lane of garden-houses and other buildings. After leaving these, we emerge into an open country, divided into fields for the cultivation of Indian corn and grain —the latter being a species of grain much resembling in size and appear-

ance the lentil, and used exclusively to feed horses and sheep upon. Over the gracefully-waving stalks of the Indian corn you have an uninterrupted view of the deep-blue ocean to your right, and to the left a distant range of mountains. In the fields are occasional knots of dwarf palm-trees, to the branches of which scores of pilfering old crows, taken in the very act, hang dangling in the air, to scare away their race from the neighbourhood. Besides these there are many other and still more successful contrivances set up by the wary husbandmen for the preservation of the grain; and amongst these the one that creates the greatest terror to the feathered tribe is a tall bamboo, planted upright in the ground, on the top of which is a whirligig perch, so finely balanced that the weight of a sparrow is sufficient to set it in motion. The perch is very much in the shape of the reel used for winding-off silk; and at the end, on either side, are suspended small bells and tin rattles, which create a tremendous din on the slightest impetus being given to the perch.

After traversing these fields, which are all on a gradual slope, we come upon the confines of that portion of Vizagapatam called Wattair. The first place we pass is a magnificent and extensive park, with a large dwelling-house in the centre, the property of a wealthy and much-respected Tamul gentleman, Gooday Soriah Precarsha Row, now, we are sorry to say, dead. Here the high road leads by a rather circuitous route outside of the boundaries of this extensive property, which is many miles in circumference; but the lamented and amiable proprietor, during his lifetime, threw the gates of his park open for the free ingress and egress of all Europeans: thus not only saving a weary mile to those whom business or pleasure called from Wattair and Vizagapatam, but affording them a most delightful carriage-drive of an evening all through the park, where rare trees and flower-plots varied the monotony of the everyday public-road drive.

Precarsha Row's house was in good keeping with the garden and the park. An elegant marble basin, in which revelled shoals of beautiful goldfish, was kept continually supplied with water by a fountain in the centre, perpetually overflowing from the crystal shower of a *jet d'eau*. On either side of the basin rose two stupendous banian trees, whose wide-spreading branches threw a pleasant shade far around during the heat of the day.

There is a fabulous story, not generally known in India, connected with the banian-tree; and its aptitude was never better appreciated than, when standing under the shade of these veteran trees, we contemplated, first, the innumerable crystal drops that fell in an incessant shower from the lofty jet to the surface of the clear waters below, and then turned our eyes to the branches overhead, and there perceived the equally plentiful, though far less beautiful drops, formed by the twigs, of all sizes in growth, which, in apparent contradiction to the laws of nature, grew downwards from year to year, without leaf or other outward sign of life, till they penetrated into the bowels of mother earth, and there firmly planting their many roots, increased in course of time in bulk and strength, till the fragile twig, easily severed by a small penknife, rivalled in dimensions the mother trunk from which it, with its thousand brethren, sprung. It is a well-known fact that there are some of these banian-trees in the interior of India so large that one tree has been calculated to be all-sufficient to afford shelter to a troop of cavalry, horses, men, and all: and whilst upon this subject we may be permitted to remark that these

young shoots of the banian-trees seem to possess a quality highly beneficial to the teeth and gums. The sap, or milk of the tree is much in vogue amongst native doctors; but the Indians, who are noted for possessing excellent teeth, and to whom tooth-ache and gumboils are utter strangers, invariably make use of the delicate twigs of the banian-tree for cleaning their teeth. They are so plentiful that they indulge in the luxury of a clean toothbrush every morning; and we imagine that the delicate sap contained in the twig (the head of which is bruised with a stone) has some hidden property, which by the aid of chemistry might be found highly beneficial as a substitute for the trash sold now-a-days for tooth-powder.

But to return to our fable. "The first banian-tree," so goes the tale, "which ever grew upon earth, was not of the same nature and form as those seen now-a-days; for though a stately tree, it was, like the generality of its neighbours, possessed of only a single trunk, instead of the dozens it has now: and the weeping-willow, its neighbour in the garden of Eden, was a sprightly young tree, with all its branches growing straight up in the air, like a stiffnecked gentleman with a military stock on. Now these two young gallants, discontented with their position in nature, though stout and robust, and a good head and shoulders taller than the usual run of trees, were always complaining and condoling each other with their hard fate—the banian complaining that Mother Fountain, who was always making such a noise about her arduous duty in being obliged to supply all the trees in the garden with water, never took the trouble of sending any of her streams to quench his thirst, which was sometimes intolerable of a summer day; and there's no knowing what would become of him if it was not for his friend Dew, who sent him a liberal supply of drink every night.

"'Friend Banian,' quoth the Willow, 'I consider your misfortunes a trifle in comparison with what I suffer from that odious old witch,' meaning the fountain; 'in faith there is not an hour but what she sets her cap at me, and sends one of her nasty wet nymphs to come and cajole me into a marriage. It is really very provoking; my shoes are continually damp, and I'm afraid I shall catch my death of cold through her.'

"'Ay,' says the Banian, 'I wish I could stoop like her sister *jet d'eau* does, and put on a wig of frightful ugly ringlets, like those she is continually wearing; would not that drive her mad, eh? ha! ha!'

"'Upon my word so it would: ha! ha! and I'd join you with all my heart; but my confounded stock' (in the original, 'neck') 'is so dreadful stiff that I can hardly bring my eyes on a level with the old thing.'"

And these two mockers were taken at their word; the banian grew awry all of a sudden; and, in lieu of false ringlets, saw its own branches dropping ugly little shoots in every direction; and the willow's neck was loosened, and his head fell over his shoulders, and his branches grew mournfully over the cool water, longing to sip a little (for the streams had left off calling to see him)—a drop only to quench his terrible thirst.

"This," says the fable, "was the way that Vishnu punished the naughty trees, and thus naughty and discontented people are punished to this day."

And now return we to the dwelling-house of Gooday Precarsha Row, or rather to the basin in front of his house. A neatly-kept gravel walk

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IN THEIR CORRECT

ORDER.

leads all round, and under the banian-trees are ranged gaily-painted garden-seats. A wide flight of stone steps, of a chequered pattern, with marble balustrades, leads up to the large open verandah, along which are ranged choice European flowering-plants in open work; China vases and birdcages full of little warblers are suspended from the lofty beams of the terraced roof by chains with pulleys like lamps; a lustre is suspended from the centre beam, and is lit regularly every evening with cocoanut-oil-trimmed lamps, which burn throughout the night. The sum that this light annually costs for oil alone was something quite astounding; but then every other apartment in the house had a similar chandelier, besides wall-shades and other lamps innumerable, the conjoint expenses of which amounted annually to something that would have been a very comfortable income to any half-dozen ordinary families. But then Soriah Precarsha Row lived in a princely style; and moreover, this superabundance of lights, besides the effect it produced on the minds of the natives, had something to do with religious ceremonials. The hall was a vast room, fitted up with very costly furniture. There were no carpets, for the heat of the climate did not admit of these costly luxuries; but in lieu thereof a costly China mat covered the floor; and from fine marble-slabbed tables, tall pier-glasses, richly gilt, reached up to the ceiling; the sofas were rich satinwood, inlaid with ebony, and the cushions and covering of the finest damask. But what struck the eye more than anything else was the amazing variety of clocks, of all sizes and shapes, which were placed in every available nook and corner of the room: and here the native shone forth conspicuously; everything else was arranged after a taste wholly European. Miraculous clocks they were, too, startling you every now and then with a cunning display of their mechanism: old gentlemen, à la Gog and Magog, who were seated quietly on a stone bench on the top of the clock, started up suddenly in the wildest frenzy, and fought each other with clubs, every blow telling, not on their respective bodies, but the hours. Cuckoos flew out, and so did other strange birds—strange, at any rate, in an Indian clime. At the further extremity of this room was a large arch, which led into a pleasant alcove, overlooking a tastefully-arranged flower-garden, with the richly-scented Malia Poo (Indian jessamine), and the Bengal rose twining in and out of the window-blinds. Here the good man of the house was wont to sit of a sultry day, and read or chat with such gentlemen as paid him a morning visit.

His lady wives were secluded from view, and occupied a house separated from his own, and shut out from view by a long, stone-built passage, arched over with light trelliswork, and thickly covered with the leaves of the Burmese and other Indian creepers.

Soriah Gooday Precarsha Row was a man of very good intellect, and one deeply read. He was a good English scholar, and also well versed in Sanscrit and other native languages. In addition to handsome features and a fine, manly form, he possessed manners the most courteous and agreeable; was a perfect gentleman in every sense of the word, and possessed the bright and rare virtue of charity. Many of the poorer natives lived entirely upon his bounty; many more were indebted to him for their means of success, and all deplore his premature removal by death from the sphere of his truly benevolent actions.

After driving through Precarsha Row's park, we enter the cantonment of Wattair, consisting of a great number of straggling houses, built on

the left side of the highway, alternately on the top of a high hill and in a valley. To the right of the highway, though the ground is a considerable elevation above the sea, it is a level surface, and is laid out in extensive compounds, with bungalows and outhouses, occupied by the civil and military officers of the station.

On first entering Wattair, we pass the last place we go to in this world—the churchyard. It occupies a considerable space of ground, and is walled in all round. It contains some very handsome tombstones; and the greater proportion are to the memory of females and children; for though Wattair be about as healthy a station as any in India, old age and infirmities dwell there as elsewhere. A little further on, and we come to the Protestant church; and opposite to this, in a small valley between two very high hills, on either of which is perched a house, occupied generally by some of the officers in cantonment. This is the convalescent bungalow, allotted to the Judges of the Circuit Court, who have thus the option of either living in the fort or at Wattair. In a tent behind this bungalow we rusticated for several months—for the bungalow was too small to afford accommodation to so large a party as we made. The tent was very agreeable at nights, and we seldom resorted to it during the daytime, except for the afternoon siesta, a luxury which the very crows and house-squirrels—those two noisy plagues of India—indulge in.

From the elevated position of Wattair, strong gusts of wind and whirlwinds, or pishashes, were of frequent occurrence; and under the influence of one or the other of these our tent came down on three several occasions; the snapping of the ropes that sustained it giving us loud and timely notice to make a precipitate retreat through the doors into the open air, and thus avoid the unpleasant risk of being smothered by the wet and heavy canvas, or getting knocked on the head by the corpulent tent-pole. These whirlwinds were of short duration, as they sped on their circular flight, raising a dense cloud of dust, and whipping up huge empty wine-baskets, and other light wickerwork, which chance had placed in their way, to an incredible height in the air, till they looked like mere specks. These were sometimes carried over a space of more than a mile's distance, and the fishermen on the seaside were not unfrequently astonished by sudden showers of straw, bits of rags, fragments of baskets, and other light materials of a similar nature.

The setting in of the monsoon at Wattair was a grand spectacle to witness. Bank upon bank of heavy, cumbrous clouds rose up in the direction of the coming squalls—sure forerunners of the wet season. The day was extremely sultry; the night uncomfortably hot; sheet-lightning was incessant, and the distant growl of thunder perpetual. By-and-by the low moaning sound of the breeze was heard as it came over hill and dale—a first gentle indicator of what was to follow. Every one rushes out of doors to get a sniff of this cool and balmy air, for it smells of freshly-mown hay, and there is coolness and vigour and health in its breath. Dried leaves and decayed stalks fall thickly beneath its increasing pressure, and the vanguard of the storm, in the shape of dark, ominous clouds, detached from the distant dark bank, float swiftly overhead, darkening for minutes together the glory of the sun, and dropping occasionally fat drops of rain in their onward flight: the swallow flies along the surface of the earth, and tiny little birds seek refuge in the thickest part of the thickly-set milk-hedges; the lowing of cattle resounds from all

sides, and the cawing of large flights of crows is heard high up in the air, as they wing their way home to tops of cocoanut-trees, many miles away; a detachment of screaming hens, running and flying over the nearest hill, where they have been all the morning on a foraging party, now come in search of shelter, nearly swept off the ground by the impetus of the wind, and followed by the stately old cock, who, with tail distended in the air, is in a towering rage, endeavouring vainly to maintain his accustomed dignified strut; a small fleet of turkeys, in full sail before the wind, heave in sight round the corner of the house, making more noise about the tempest than ever did shipwrecked mariners. These are brought to an anchor in the henroost, and then the rapid dispersion of the large banks of clouds, which now spread a sombre pall all over the heavens, and the distant sound of wind and rain, pronounce the arrival of the monsoon. Natives in the streets take to their heels, and run in the direction of the nearest shelter; young officers are seen scampering up hills on their winded tattoos towards their respective homes; everybody gets in doors, and everybody lends a hand to fasten and bolt and bar every window and door in the house; the cat crouches in the corner of the sofa; the dog composes himself to rest under a chair; there is a bright gleam of red glaring light, and the house trembles again beneath the appalling and almost instantaneous crash of thunder. For a second all is black and perfectly still; then the whole might of the tempest bursts with fury around; the wind roars; the rain falls in torrents; lightning and thunder, rain and wind; wind and rain, thunder and lightning. Half-an-hour elapses, and the elements get exhausted; the sound of the thunder grows fainter and fainter; the wind decreases; the rain is not near so heavy as it was; you venture to open a window, and then a door; and the sun peeps out from behind a cloud, and every now green and fresh-looking blade of grass has a tear in its eye, as though weeping with joy and gratefulness for this timely supply to their wants from the rich fountain of ever-watchful bountifulness: and so do the flowers and leaves of shrubs and trees; and all parched nature looks thankful—all except man entertain this sentiment, and he is grumbling because he cannot get out for his evening's ride, or some other such frivolous disappointment. What does he want with rain? He never drinks water, and has sixty dozen of ale in his cellar, besides endless bottles of wines and liquors.

There is something, however, in the soft sweetness of the prospect, the fresh, cool breath of heaven, which brings a gentle gladness, verging on a thankful spirit, to the heart; at least, the man that is not inspired with a feeling of this kind can have no more sentiment than yonder duck, who is standing on one leg by the brink of a gloriously muddy pond, with one eye cocked up in astonishment towards the sun, as much as to say, "What business have you out on such a wet day as this?"

The monsoon has set in, and the weather being cooler, the gay season at Wattair commences. Dinners, balls, quadrille parties, are now of frequent occurrence. The officers of the native infantry regiment give a dinner to the Circuit Judge, who is the great man of the place; and the ladies are invited to a ball in the evening, to meet Mrs. Judge. All the males meet at the mess-table, as guests of the hospitable officers; all the females meet in the ball-room, and "wonder when those wretches mean to leave their wine," for they can distinctly hear the jingling of glasses and rattling of knives and knuckles against the table, as emblems

of applause, as the colonel, in a long-winded speech, in which he has proposed the health of their respected guest the Judge, winds up with, "than whom a better friend, or more hospitable, generous man never existed, nor a wiser judge ever sentenced a criminal to be hanged." The band tunes up, the conviviality ceases, white kid gloves flourish in every direction, the gun fires (not as a signal for the ball, but because it is eight P.M.); for a few seconds nothing is heard but the noise occasioned by the winding up of several scores of watches. The band strikes up, and the first set of quadrilles are danced; then follow waltzes, gallops, &c., and the hot musicians have no quiet or peace till the hour of midnight arrives. Supper is then announced; the band has supper brought to them, and oceans of cold punch—just to strengthen their lungs, poor fellows. After supper every one is in capital spirits; and in the supper-room a little boy with a large basket is collecting the champagne corks. Rather expensive affairs these balls and suppers; at least, so sighs the junior ensign, as his eye glances over the mess-bill at the end of the month.

The last ball for the season has been given, and so has the last large dinner-party. The hot weather returns, and the mess library has been besieged with applicants for new novels, magazines, and other periodicals. Gentlemen with limited incomes begin to retrench their expenses, and live small for a few months, limiting themselves to half-dozen bottles of beer per diem, a bundle of cigars, and a chicken curry.

Occasionally the season winds up with a wedding, which sets all the bachelors and unmarried ladies in a flutter for a month or six weeks. Sometimes a funeral is the melancholy termination, and then everyone looks sedate and pensive.

So passes the year at Wattair; and in comparison to the greater number of what are termed up-country stations, Wattair certainly claims pre-eminence.

NO LIE THRIVES.—No. XVII.

It was in that feverish state of mind consequent on previous intoxication, that he stood at the terminus of the —— Counties Railway, with his omnibus, the morning that Mr. Davis and Willis reached London as before related. He recognised his father immediately, though probably through agitation, he did not perceive that it was Willis who accompanied him. When, however, he obeyed the stroke of the umbrella, and inclined his head to receive his instructions, he gained a full view of his countenance, and knew him at once. Such was his perturbation, that he was scarcely able to maintain his footing. His hand touched that of his father, as he returned the change, and a sensation amounting to faintness overcame him. Every object swam before his eyes, and whether Willis or another passenger who got out at the same time, paid him or not, was unknown to him.

The state of mind in which this rencontre had thrown him during the remainder of the day, was such as might have awakened the strongest pity in the heart of a parent. Eat he could not, drink he did, not to a degree that overpowered him, but which rendered him irritable and quarrelsome. It was late when his day's work was done, and he had

some distance to walk, but he resolved, notwithstanding, to go to the hotel where he had set his father down, and make out what he could respecting him. Framing, therefore, a plausible excuse for his inquiries, he addressed himself to a waiter, and from him learnt that the elder of the two gentlemen was in the house, of the younger he knew nothing, except that he heard he was going to Regent-street. "The gentleman is gone to bed," added he, "but if you like to call to-morrow morning, I will deliver any message you require." Frank thanked him and withdrew.

He had not left the hotel more than a few yards, when the shriek of a female rung loudly in his ear. Several persons were assembled round a man and woman, between whom the most abusive language was passing.

"You not only accused me of robbing you, which I never did," cried she, "but you struck me,—see how I bleed—coward as you are!"

"And I'll strike you again," exclaimed he, raising his arm and flinging himself forward. He dashed the spectators aside, and the woman, again shrieking loudly, stood so as clearly to be seen. Before the blow had fallen, an arm had felled her accuser to the ground. It was Frank's; he had recognised in that wretched woman Sally Groves, and he had obeyed instantly the impulse to defend her. Seizing her by the hand he was leading her hastily across the street, when the man, recovering himself, rushed after him, and in his turn knocked him down on the ground; at the same moment, the wheels of a carriage which was proceeding at a quick rate, passed over his body and one of his legs. He was dragged upon the pavement insensible, and immediately conveyed to the Hospital.

It was soon ascertained that he had received a severe internal injury, though its exact nature was not apparent, and his right leg just above the ankle was broken. He uttered deep groans, and his pain was excessive for many days. Concurring circumstances of an unfavourable nature produced fever, and several months elapsed before he was able even to leave his bed. Part of this time he was scarcely conscious of what was passing. He was skilfully and kindly attended and nursed, but it was a time of bitter trial to him. Sally went several times to see him, and never without being the bearer of some little proof of consideration on her part. It was in vain that Frank forbade this. "I have no other pleasure," said she, one day in reply to his remonstrance, "and you would not deprive me of it, would you?" Pleasure!—alas! she could have told him that she was most wretched; but she suppressed every hint of her misery, lest the self-reproach which it was natural he should feel, might aggravate his sufferings.

Her manner on one of these visits was so very sad that Frank was immediately sensible of it, and he inquired into its cause. It was evident that something lay heavily on her mind which she had not the courage to communicate.

"Sally," said Frank at last, "what is it you would tell me? suspense is worse than the knowledge of the truth."

"I have bad news for you," replied she, looking mournfully at him; "can you bear to hear it?"

"What have I just told you?" said he, trembling; "go on."

"I met a friend of mine yesterday," replied she, "who is lately come from the country." She stopped.

"What is the matter with my relations?" asked he, endeavouring to grasp her arm. "Who is ill? who is —"

Sally burst into tears. "Your mother—oh, Frank!"

"What of her?"

"She died last week."

The words fell heavily on the ear, on the heart of the unhappy young man; he clasped his hands together, turned deadly pale, and fainted away.

The information that Sally had thus given him was indeed correct. For some weeks Mrs. Davis had been in a declining state; the anxiety that she had unceasingly felt on her son's account, the alteration in her husband's manner towards her, had preyed on her constitution, and gradually consumed her. Her altered appearance so struck all who knew her, that no one was surprised when it was known that she was obliged to keep her bed. Jane, faithful in illness as in the happier days of health, was her nurse night and day. Neither Harriet nor her other daughters were positively deficient in tenderness to her, but they never scrupled to excuse their attendance when it suited them, and that on such pretences as were easily seen through by one who had been accustomed to resort to them. Their insincerity was indeed perceived, and the detection carried its sting to the heart, which but too well understood all.

Mr. Davis was exceedingly distressed at the illness and danger of his wife. He had ever been exceedingly attached to her, and their present alienation, if such it might be called, was nearly as painful to himself as to her. His attention and tenderness to her were again extreme; but though Mrs. Davis was very grateful to him, and to a certain degree happy in the apparent restoration of his affection, she knew him too well not to be aware that she had forfeited his confidence, which above all other things was her boast; and every proof of his solicitude for her conveyed reproach to her mind. The interdict respecting the mention of Frank's name was not removed, and the strictness with which it was enforced was anguish to her.

Mr. Courtenay, the medical man, who had attended the family for many years, was well acquainted with most of the circumstances connected with the absence of Frank, and well knew that the grief resulting from these at once caused the illness of his patient, while it baffled every effort of his skill. He learnt as much from Jane as was consistent with her duty to communicate, and he made the best use of his knowledge both towards Mrs. Davis and her husband.

"Oh, Sir!" said Jane to him one day, "what a comfort are you to my poor mistress, and to us all!—your medicines are the least part of the blessing your presence brings."

Mr. Courtenay smiled. "It would be strange," said he, "if I were not to endeavour at least to be a comfort to those who intrust me with their welfare. Mind and body are so dependent upon each other, that he who would benefit the one must be regardful of the other. Besides this, few men see so much of the miseries and afflictions of their fellow-creatures as those of my profession; yet rely upon it, the most lengthened acquaintance with sickness, and the sorrows entailed upon it, does not stifle or deaden in us the feelings of pity and sympathy. It would be foolish to say that we weep with every one that weeps, or that the sight of any degree of suffering unnerves us. We are men in whom, as a body, the goodness and mercy of God may be distinctly traced—if it were not so, we should be seen brutal as the natural effect of constant familiarity with human woe and human suffering."

"If we could but hear some news, no matter how trifling, of Mr.

Frank," said Jane, "it would be a great thing in my poor mistress's favour; but I don't know that she feels this worse than my master not allowing any conversation about him."

"I was in hopes Mr. Davis had relaxed in that respect," replied Mr. Courtenay. "I wonder that he can carry his inflexibility so far."

"You would not, Sir," returned Jane, "if you knew as much as I do. My master was very fond of Mr. Frank, and had great expectations of him. Everything that was good in him was exaggerated by his mother, all that was blamable or could give a parent anxiety was entirely withheld, so that the blow he received, when it fell, was dreadful. It was a great pity, for if my master and mistress had acted together, all might have been happy now,—but there is Mr. Davis, if you wish to speak to him."

Mr. Courtenay immediately joined him. The purport of his present visit was to propose that he should bring an intimate friend of his, a physician of celebrity in London, whose society he expected for a few days, to call on Mrs. Davis with him. Mr. Davis gladly accepted the offer, and it was agreed that Dr. Luxmore should see Mrs. Davis the next morning. Before they reached the house, Mr. Courtenay had briefly informed the Doctor, under what state of feeling his patient was labouring.

"Poor thing!" said the Doctor, when he had finished, "the physician has little prospect of gaining credit in cases of heart sickness. I see this every day in my visits to —— Hospital: young and old of both sexes from this cause, sometimes known to us, sometimes hardly suspected, defeat the science, and baffle the energies of the most skilful amongst us. Singular circumstances, too, respecting individuals occasionally present themselves; and if instances of human depravity call forth our indignation or sorrow, bright sparks of worth, shining often in the dark caverns of the human heart, like diamonds in a mine, reconcile us to our kind, and change contempt or abhorrence into pity and commiseration. You smile as if you thought I was taking a flight in the regions of fancy—smile, if you like—my remark was drawn from nature, and from certain recollections of a case in the Hospital; I shall not repeat the particulars, nor how I became acquainted with them. The parties were a young man, who had received very serious injury from the wheels of a carriage having passed over his body, and a poor girl who occasionally visited him, and to whom he was really indebted, for her kindness was indeed most disinterested. I shall think of poor Sally.—By-the-by, she comes from this neighbourhood."

"Indeed!" said Mr. Courtenay, who till now had allowed his thoughts to wander; "what is her surname?"

"That is more than I can tell you," replied the Doctor. "If I ever knew it, which I should suppose too that I did, I have forgotten it."

"And the young man's?" asked Mr. Courtenay.

"Clarke, certainly," replied he.

"Then I am at sea again," said Mr. Courtenay. "I positively began to think I had obtained a clue to our fugitive. If it be Sally Groves that you have seen, she knows something of Frank Davis, I am convinced. Are you likely to fall in with her again?"

This the Doctor told him it was impossible for him to say; but he promised that he would make some inquiry after her as soon as he returned to town, which would be in about three weeks, and would inform him

if he had anything worth communicating. Mr. Courtenay mentioned the circumstance to Jane, but forbade her to say a word to her mistress about it—an injunction which the agitation produced in her own mind by such a surmise, rendered unnecessary—for it showed her clearly what would be its effect on her more sensitive mistress.

Mrs. Davis was worse that day than ever Mr. Courtenay had seen her, and neither he nor Dr. Luxmore gave the family any hope of her recovery; indeed, her end was fast approaching. The greater part of that afternoon she had been unusually inclined to talk to Jane; one subject alone, however, occupied her thoughts—she could speak of no one but Frank.

"I shall never see him again," said she, taking the handkerchief that lay on the sheet beside her, and wiping her eyes; "hope of that is gone; but if I could but know what is become of him, I could be reconciled to the thought. Sleeping or waking, I have him always before my eyes. Sometimes I see him in the waters, struggling with the waves, and drowning. Sometimes I fancy frightful-looking wretches are murdering him; and I think I echo the shriek in my sleep that I dreamt he was uttering. Sometimes I see him dying of hunger, and hear him calling on his mother for food. Oh, Jane! often when you have urged me to eat, thoughts of my poor Frank it was, that made me turn heart-sick from the dainty morsel."

She held the handkerchief again to her eyes, and for a few moments was silent; nor did Jane think proper to speak to her.

"Are you there, Jane?" cried she. The faithful creature took her hand.

"I wonder what could have made such a youth as him go astray so sadly?" She paused, and Jane was silent. "And to hide all from me," she resumed; "from me who was always so indulgent to him. Let him have deceived whom he might, he should not have deceived me—should he?"

She looked at her earnestly, but Jane was silent.

"There was no excuse for his deceiving *me*, Jane, was there?" asked she.

But Jane saw not the working of her heart, though something in her own intimated that there was more meaning in these questions, than the mere words conveyed.

"Will you be displeased," said Jane, at last, "if I tell you honestly and truly what I think?"

"I promise you I will not," replied she; "tell me all; there is more here" (and she laid her hand on her heart) "than will ever be known, if you do not speak out now—more than ever I shall afterwards find words to say."

"Oh, my dear mistress," cried Jane, tears starting from her eyes, "if I must speak out, I will. I grieve to say that I cannot but blame you in some things, kind and good as you have been. If you yourself had kept to the plain, simple path of truth, it would have been better for us all—children and servants would have done their duty more truly, and much of our present unhappiness, if not all, would have been avoided."

Her eyes had been fixed on her mistress's countenance all the time she was speaking, and a glance of displeasure would have checked her; but no such expression was discernible, nor did her words seem to give pain. On the contrary, her features became more lightened, and something of her former animation returned.

"Good creature!" exclaimed she, extending her hand to Jane, "you are right; the fault lies with me. I have seen it; I have felt it for some time; but I could not own it. What a relief is this to me! Oh, Jane! I have acted very wrong. It is I who taught my children, and poor Frank especially, to deceive; and that by telling half truths, and giving false colouring to what I said. Yes, yes, I do but drink the dregs of the cup I gave so constantly to others. I thought it wisdom, and I find it folly, not to say more, as I might, to use any subterfuge. I prided myself on my dexterity, in this respect, and now I look back upon it with shame and sorrow. I cannot own this to my husband, nor to my children; I cannot bear that he should think more meanly of me, than I fear he does, when I am gone; and they would not understand me; perhaps, would not give me credit for what I say—that is a bitter thought. Oh, Jane! if you can do anything to correct the habit I know they are all guilty of, for my sake, for your mistress's sake, use your utmost endeavours to effect the good purpose. Your master will never part with you; and it will be a comfort to me to hope that my errors may be counteracted by your steady virtue."

Jane had sunk on her knees by the bedside—she kissed the hand that grasped hers, and bathed it with her tears.

"I will do all—I will do anything you wish," sobbed she.

"Enough," said Mrs. Davis, with a faint smile; "I am satisfied. I thank and bless you. Now, listen to what I am going to say." Jane obeyed her mistress, and sat down in the chair beside her. She then gave full instructions to her respecting Frank, in case he should return; and when this was done, she desired her to give her a pair of scissors, and to help her to sit up. Cutting off a lock of her hair, she put it into Jane's hand, with a charge that she should deliver it to Frank, with the love of his dying mother. "I would add forgiveness," said she mournfully; "but, poor boy, I need his pardon, perhaps, more than he needs mine."

She again laid her head on the pillow, wept for some minutes, and then sunk into a sleep. Jane stood to watch her. Presently she heard the step of her master; and, gently motioning him to make no noise, she pointed to the other side of the bed. For some moments he contemplated his wife in silence.

"Is she worse?" asked he, speaking more loudly in his alarm than he would otherwise have done.

The voice aroused her; she opened her eyes, and recognised him. The expression of her countenance overpowered him, and the stern man wept as he laid his cheek to hers.

"Only this once," murmured she, with difficulty. "Frank—forgive—"

It was the last effort of nature; the sentence remained unfinished; the seal of death was on her lips.

[*To be continued.*]

Soy, the well-known sauce, is prepared from the seeds of an East Indian plant, Dolichos soja; the seeds, having some resemblance in shape and colour to a beetle, have probably given rise to the sailors' joke that soy was made from beetles or cockroaches.

ON GEMS AND PRECIOUS STONES.—No. II.

The mode of estimating the value of the diamond is by its weight in carats. If we have a diamond of the first water, *free from flaws, and properly cut*, its value is as the square of the weight in carats multiplied by eight. Diamonds of from one to five, or even ten carats are readily sold at that price; for diamonds of a larger size it is not so easy to find customers. A diamond of one carat is worth 8*l.*; a diamond of two carats is worth 32*l.*; one of ten carats is worth 800*l.*

Comparing the diamond with those substances which are of the greatest utility to mankind, we find the money value of the latter, as compared with their utility, to be in an inverse ratio. Take a substance very similar to the diamond in composition, namely, coal. To express the value of an ounce of coal we have no coin sufficiently small; it is the same with iron and lead (metals of inestimable importance). An ounce of copper may be worth a penny; an ounce of silver may be worth five shillings; an ounce of pure gold, four pounds. But the very refuse of the diamond—that which is only used for the purpose of breaking up into small particles for cutting other stones, is worth fifty pounds an ounce.*

In India there are modes of estimating the value of precious stones quite independently of their money value. The Hindoos have various superstitions respecting them, medicinal and other virtues being attributed to certain stones, which are frequently pierced and worn about the person as charms.†

The working for diamonds in the Brazils, as described by Mr. Mawe, consists in first scooping out gravel and alluvial soil from the beds of rivers, and then allowing a current of water to pass over the same, which is arranged in troughs, and continually raked up to the head of the troughs, so as to be kept in constant motion. By this means the earthy portions are first washed away, and the remaining gravel is carefully searched for diamonds. These, when below the water, resemble pieces of gum, and are very easy to be recognised by any one who has once seen them.—See 'Travels in Interior of Brazil,' by J. Mawe, Lond. 1812.

Dr. J. E. Cliffe, the owner of a diamond mine in the Brazils, who was in London last year, has kindly furnished me with the following

* The annual value of the iron and coal raised in this country is about twenty million pounds sterling; whereas the whole annual value of the gems and precious stones imported into England does not amount to half a million pounds sterling.

† The diamond is supposed by some to be a preservative from lightning, and to cause the teeth to fall out when put into the mouth; but this is objected to by one author, on the ground that diamond-powder has been used for tooth-powder with no bad effect.

The medical properties of the sapphire are supposed to be remarkable: "it purifies the blood, strengthens, quenches thirst; it dispels melancholy reflections; and as a talisman, averts dangers, insures honour and competence."

The medical and talismanic properties of the emerald are, averting bad dreams, giving courage, curing palsy, cold, &c.—*Oriental Accounts of the Precious Minerals*, translated by Raja Kalikishen; with Remarks by James Prinsep, F.R.S., &c., in the "Journal of the Asiatic Society of Bengal," page 353, vol. i. Calcutta, 1832.

particulars of the mode of washing for diamonds on his property and in the neighbouring district:—

"On the third of the great north and south range of mountains from the sea-coast, going westerly, and commencing at the village of Itambé, in Minas Geraes, and thence northerly to Sincora, on the Paragussu River, province of Bahia, a region comprised between 20° 19′ to 13° of south latitude, diamonds are found in greater or less abundance; but the principal working, so long known as the diamond district, is the high, mountainous, and sterile tract of country situated between the heads of the northern branches of the River Doce, the heads of the River Arassuahy, the heads of the River Jequetinhonha, and the heads of the great river of San Francisco. The prevailing rock is the itacolumite, or mica schist, occasionally intersected with irregular quartz veins, running in all directions. Portions of those mountains, with the occasional mountain flats or plains, the valleys of the watercourses, as well as the beds of the streams, have always been considered the most productive in fine stones, both for quantity, size, and quality; and this has been more remarkably so where the rocks are pointedly appearing upwards, and projecting from 1 to 10 ft. in height, but are characterised, at the same time, as being deeply weather-worn, as though the teeth of Time had literally bitten pieces out of them, many having holes completely through them; others contain cavities, which, if laid horizontal, would hold many quarts of water. In those parts of the mountain where the mica schist is either at an angle to the plane of the horizon, or in flattened layers, and smooth in its articulations and surfaces, very few, if any, stones are found. In several instances in this mountain range, stones occur on the truncated cones of the larger groups of rocks or rocky mounds, rising out of the mountain plain, especially near the village of Datas; but the beds of watercourses, both ancient and modern, and even those from small springs, as well as large rivers, with their adjoining flats, have been washed for diamonds very extensively. Many places have proved to be highly rich, such as Curralinho, Datas, Mendanho, Cavallo Morte, Caxóeira do Inferno; these are not only remarkable places from their having produced many diamonds of superior quality and size, but are literally surrounded with those pointed rocks projecting from their rocky bases. In the Jequetinhonha, with its numerous heads, the richest diamonds have been regularly found; but only on one side of the river, viz., the left-hand going downwards to about twenty-five leagues, where they gradually become so small that many are required to make a grain weight: some are fragments, but many are perfect crystals. For a few leagues the river is barren, but at the junction of the Itambicuruçu (a river which rises in the mountains of Graõ Mogul) diamonds again appear, and becoming smaller and smaller, gradually disappear some few leagues farther down. Gold dust and platina are found in the river, and seem to have followed the same laws of motive power. Gold is no longer washed for when the fineness is such that it literally floats away in endeavouring to separate it in the washing-bowl. Three leagues north-west from Diamantina a clay vein exists of some considerable length: it is very soft, and of the breadth of 19 ft.: it was rich in diamonds for about 200 yards in length, and 60 ft. in depth. At present it is washed below the level of a brook; the owner finds, as the depth increases, the produce is materially lessened. There is a good deal of sameness in the colour and the leading features

of the crystallization of diamonds from each range or locality, and also in quality, but not in size. In the gravel (cascalhão, diluvial), at the bottoms of the rocky rivers, or watercourses, especially the large ones, there is a mixture of all sorts of stones from the upper, but none found from the lower ranges. The rivers are usually turned by ingeniously building a dam, with triangles of timber and fascines of stones, enveloped in grass, and channels, formed laterally, by walls of the same material, sufficient to carry off the water, leaving, with the aid of a pump and water-wheel, the bed of the river dry. The workings of the river have, firstly, a depth of sand, and recent matters from the washings above, varying from 6 to 20 ft. in depth, intermingled with rocks of all sizes; then a yellowish gravel (cascalhão), composed of water-rounded quartz, jasper, and sand and ironstone, forming a uniform thickness, lining the bed of the river. Usually, the upper surface is tolerably even, and regular in thickness for miles together in extent; thus the rocky bottom of the river may be said to be coated with this gravel. This contains the diamonds and a little gold, and is carefully carried out as long as the dry weather lasts, which is from April to the middle of October, and then washed after the rains commence, which immediately destroy all vestiges of the washings. Occasionally holes, waterworn (panellas), exist in the bed of the river, coated with conglomerate (canga), which are often rich in diamonds and gold. Five years ago, one of these holes (which had escaped detection in previous washings) was found by accident in the river: nearly 10 lbs. of superior stones were found in it, and 28 lbs. of gold dust. A place called Pimentos is also rich in diamonds; it had been once the bed of the river, but it was worn so deep and narrow that a large rock choked up the entrance, and for the river a new channel was formed, which was found, on washing it, to be without the diluvial gravel, or cascalhão. An accident gave rise to the tracing out of the old bed about six years ago, which nearly throughout was exceedingly rich in stones, remarkable for their size, as well as their uniform good quality. The Bigonias River, a branch of the River Pardo, and a confluent of the San Francisco, was also very rich, and is situated on the most Alpine rocky place I have ever seen: in some places, for a mile or two, a snuff-boxful of earth could not be found. Here the *débris* contains the most perfect-formed octahedral crystals of rutile; in fact, from their specific gravity and analogous shape, and possessing something of the metallic lustre of the diamond, more difficulty exists in separating the small diamond from them in the washings. Sincora, in the province of Bahia, which, a few years ago, gave such large quantities of stones, is no longer worked, as the expense of provisions, the pestiferous climate, the extraordinary class of people, of many nations, who took possession of the most likely places, the great mortality, the inferiority of most of the stones, and the consequent depreciation which ensued from their abundance, in some cases to nearly one-eighth of their value, soon brought it into disrepute. The stones here were characterised as being found superficially, and by having their crystallization extremely perfect, and highly polished on the planes. A considerable quantity of a black substance was found, of specific gravity like the diamond, but lamellar, or rather composed of a series of lamellar plates, and vesicular, but generally in fragmentary pieces. It was too imperfectly crystallized to be cut, although possessing brilliancy in places, and it admits of being pounded as dust for polishing other stones. It was termed 'carbonado' by the

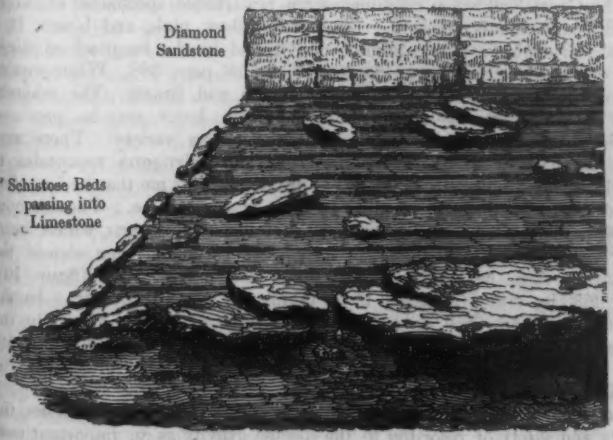
discoverers, from its charcoal-like appearance. In washing for diamonds, they are generally spread out over such a large extent of country, that there is no difficulty in finding some of them; but the real difficulty consists in finding a place which is commercially worth working; and, within a few months from the time of being found, they are slowly, but safely, transmitted to the coast, and are then forwarded to London, a very few only being consigned to Havre. They are mostly sent to Holland to be cut, then back to England to be set, and afterwards distributed over the world in their new form and brilliant appearance. In ordinary seasons, eight persons finding one half-ounce of three-grain stones are considered to have been fairly remunerated. It is said that in 10,000 diamonds only one is found exceeding 20 carats in weight. The washing or cleaning of the gravel is always imperfectly done, as every year some of it is again rewashed, and frequently as many as six or seven different times. But the process is imperfect, the specific gravity of the diamond being little above the rolled quartz pebbles, which constitute the mass of the gravel. The present mode of washing is by forming an inclined plane, where a small stream of water can be brought when required; the length is about 5 ft. by 2 ft. in width. A wheelbarrowful of the gravel is then thrown on the head of the place, which is defended by two sides of board, and also another piece at the head; a series of these is formed parallel. At the termination is an oblong catch-pit. In this pit people stand and throw water from a bowl, with some force, to the foot of the heap of gravel, as if trying to force it backwards. As the water runs off, it carries away with it a portion of sand and earthy matters. The larger stones are picked out by hand, and the process repeated till about half a cubic foot of the washed matter remains. It is then washed by hand in a bowl in the catch-pit, similar to gold-washing, and the diamonds, as they appear, are picked out. The contents of the catch-pit are rewashed as often as there appears to be a chance of its paying the cost. The gravel, broken rocks, sand, and all other matters, are carried in bowls on workmen's heads, or, if the workpeople are sufficiently numerous, are passed in files from hand to hand; occasionally a double file, one passing the empty bowls. Hitherto no machinery has been found to answer, either from being improperly adapted, or imperfectly used."

Mr. Maiden, who is an extensive importer, has subsequently informed me, that "the mines of Surua and Sincora, in the province of Bahia, also produce diamonds. The washings of the former place have been abandoned on account of the smallness of the production and badness of the quality of the stones, the greater part of which appear to me to be crystallized, and to have the appearance of having been exposed to the action of fire. The Sincora mine was discovered about the year 1843 by a mulatto miner, who had previously been engaged at the washings of Surua. On retiring from Surua, he proceeded into the interior alone and with but fourteen days' provision, in search of other washings, which he succeeded in finding in a few days. After labouring with success for some days, he found that his provisions were barely sufficient to carry him back to his home. He was therefore obliged to relinquish his labours, and return with the stones he had collected, which he offered for sale to some of the parties who had been engaged at the Surua mine. As the stones were of a different quality and shape to any they had seen before, they taxed him with having discovered a new mine. For some

time he strongly denied having done so, but on being thrown into prison, and accused of having stolen the diamonds, he confessed his discovery, and, on promise of making it known, was released. Six or eight months after, from ten to fifteen thousand persons had collected on the spot. The production was so abundant, that, for the first two years, it is supposed that nearly 600,000 carats were extracted, and forwarded to Europe. In consequence, the prices of rough diamonds fell from 38*s.* and 40*s.* to 18*s.* and 20*s.*, and, some eight months after, went down as low as 12*s.* and 14*s.* The decrease in value, increased difficulties of finding, and high prices of provisions, together with the unhealthiness of the climate, caused many of the miners to retire; in consequence of which the production has considerably diminished, and may at this present time, 1852, be, on an average, about 130,000 carats per annum. The quality of the Sincora diamonds is inferior to those found in Minas Geraes or Cuyaba. Since Dr. Cliffe's article was written, a new mine has been discovered, in the province of Minas Geraes, on the margins of the River Patrocinho. It is denominated Bagagem, and has produced some large stones." A stone was found there in 1851, weighing 117 carats, and in the months of January or February 1853, one of 254¼ carats was found in the same river by a negress.* It is said to be one of the largest and finest diamonds ever found, and was sold in the city of Rio de Janeiro for the sum of 30,500*l.*

In a paper 'On the Fossils of the Eastern Portion of the Great Basaltic District of India,' by the late J. G. Malcolmson, Esq., printed in the 'Transactions' of the Geological Society of London, second series, vol v. p. 537, 1840—will be found a description of the geological "Age of the Diamond Sandstone and Argillaceous Limestone" of India. We have subjoined the woodcut from that paper, illustrating the formation.

DIAMOND MINES IN THE TABLE-LAND OF BANGNAPILLY.



Having dilated so largely upon the diamond, time will permit me to

* It was brought to England in February 1854.

give only a brief notice of the other precious stones. I will first describe Corundum. It consists almost entirely of pure alumina, and is next in hardness to the diamond, from which it differs in crystalline form, occurring commonly in six-sided prisms, as indicated by figs. 8, 9, 10, 11, page 368, sometimes terminated at one or both ends by six-sided pyramids. In some respects these crystals resemble those of quartz, but may be distinguished therefrom by being more elongated: they are also of a superior specific gravity and hardness. The presence of certain metallic oxides in minute quantity imparts colour to this substance. When of a pink colour, it is called the Oriental ruby; when violet, Oriental amethyst; when yellow, Oriental topaz; when blue, it is called a sapphire. You will remember of these gems many rare examples in the Indian and British departments, particularly several magnificent sapphires. Diverging rays of light are also exhibited by this stone, whence it is called Asteria, or Starstone. Some very fine specimens, exhibited by Messrs. Hunt and Roskell, formed a portion of Mr. Hope's collection. The Oriental ruby, when of fine colour and free from imperfections, is more valuable than a diamond of equal weight, and a larger price is given for it in India. The finer varieties of corundum, as used in jewellery, are chiefly brought from Ceylon.

The Chrysoberyl, or Cymophane, is next in hardness to corundum: it is not much worn, although a beautiful stone, frequently possessing a milky or opalescent appearance; when cut *en cabochon* it exhibits a floating white band of light, from which the name cymophane is derived. Some choice examples gave visitors an opportunity of becoming acquainted with its appearance.

I next allude to the Spinel. This is found crystallized as in figures 12, 13, and 14, page 368: its red varieties are occasionally mistaken for the Oriental ruby, but may be distinguished by a less degree of hardness and specific gravity.

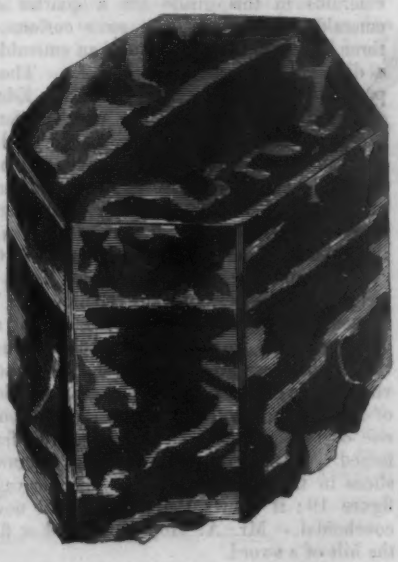
The Great Exhibition contained some remarkable specimens of Topaz of different colours, consisting of white, yellow, pink, and blue. It is found in rhombic crystals, often deeply striated in the longitudinal direction of the prism, as shown in figures 17 and 18, page 368. White topazes are obtained from New South Wales, Ceylon, and Brazil. The majority from Brazil are of a yellow or pink colour: the latter may be produced artificially by the application of heat to the yellow variety. There were some large topazes, sent as pebbles from the Cairngorm mountains in Scotland; and a clergyman from that district informs me that he has often picked up such, supposing them to be mere quartz pebbles. These mountains are famous for a coloured variety of transparent quartz, which bears their name; but the distinction may always be made, even should the crystalline form be destroyed, as in the water-worn pebble (figure 19), page 368, by either breaking it or taking the specific gravity. In the quartz, the fracture will be curved like a piece of broken glass; in the topaz, it will be perfectly smooth, as indicated by the line *a b*, figure 19, and at right angles to the axis of the original prism; pieces may be readily detected parallel to this flat surface.

An incident occurred to myself in the Exhibition, which shows the utility and safety of resorting to the specific gravity as an important test. Many of my hearers doubtless remember a beautiful stone in the Russian department, which was labelled Phenakite. This stone was of a bluish colour, and very brilliant. In company with several other persons I

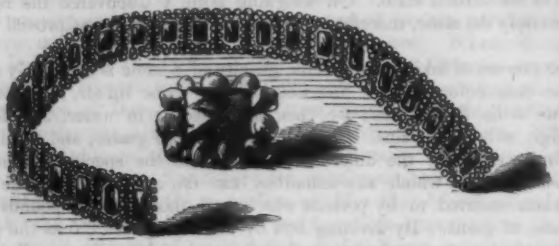
examined it closely. Opinions were various concerning its nature; one said it was a beryl, another thought it must be an aquamarine, and a third pronounced it a topaz. The owner gave permission to scratch the surface; but at my suggestion it was decided, as the safer test, to ascertain its specific gravity. I was allowed to take the stone to the Royal Institution and weigh it in their scales. I compared it with a topaz in the natural state. On weighing both, I discovered the result to be precisely the same, therefore the so-called phenakite was proved to be a topaz.

The process of taking the specific gravity of a stone is extremely simple. In the case before us, we first weighed the stone in air, and found its weight to be 562 grains; we then immersed it in water, and found it to weigh only 404 grains. Thus it had lost 158 grains, and by dividing the first weight by the difference we obtained the specific gravity. It is a simple sum, which any schoolboy can do, and yet it is one which is seldom resorted to by persons who spend thousands of pounds in the purchase of gems. By dividing 562 by 158, we obtain 3·5 as the specific gravity of this stone, whereas, had it been phenakite, the specific gravity would have been 2·7.

The Great Exhibition, doubtless, contained the finest known Emerald, and through the kindness of its owner we have an opportunity of renewing our acquaintance with it this evening. Comparing it with those magnificent emeralds on the portion of the trappings of the horse in the Indian Collection, I find it to be half an inch longer than the largest of them. The profusion and beauty of the emeralds and other precious stones in that department were almost bewildering, yet not one could be found to rival the extraordinary stone before us. It has been variously described by several authors. This beautiful stone was placed in my case at the Exhibition, and was its greatest ornament, as well as a striking feature in the general collection. The woodcut gives the exact size. It is 2 inches in length, and measures across the three diameters 2¼ inch., 2¼ inch., and 1⅞ inch; and it weighs 8 oz. 18 dwts. It is a six-sided prism, and has a small piece of quartz adhering, which if detached would probably weigh 3 or 4 dwts. This emerald was obtained from Muro, near Santa Fé de Bogota, in Granada. Several other fine specimens from the same locality were placed near it. I believe this fine crystal was brought to England by Dom Pedro, from whom it was purchased by the Duke of Devonshire. The beautiful



colour of the emerald is due to 1 or 2 per cent. of oxide of chromium. The emerald consists of silica 68, alumina 15, glucina, with a trace of lime, oxide of iron, and chromium. This stone breaks readily at right angles to its axis, and the Eastern lapidaries have availed themselves of this quality. In the girdle of an Indian chief, which formed a remark-



THE EMERALD GIRDLE, AND DIAMOND BROOCH, CALLED "SEA OF LIGHT."*

able object in the East Indian collection, most of the emeralds were slices of the natural crystal polished and mounted. The natural faces of the crystal were, in several instances, preserved, and the slices thus obtained were surrounded with diamonds, some in the natural state. This was the usual mode of mounting them previous to 1456. The slices of emeralds in this girdle are a quarter of an inch thick. Beside this emerald girdle there were some curious emerald ornaments, containing three large stones in each; also an emerald and diamond turban ornament, a diamond and emerald bridle, &c. These are a portion of the jewels previously described by the Hon. Miss Eden.

The Beryl is a substance which differs but little from the emerald, except in colour; it has the same crystalline form, hardness, and specific gravity. The Australian department contained some good specimens of this stone, and there is no doubt that when the mineral treasures of Australia come to be better known, stones fit for the finest jewellery may be obtained from it. Interesting specimens were exhibited from the Mourne Mountains county Down, and Cairngorm in Aberdeenshire.

A gigantic opaque beryl from North America, unfit for jewellery, weighing 80lbs., was in the Exhibition; but there is one in the British Museum of about the same size, and of a more perfect form. Pebbles of quartz are frequently mistaken for beryls, and *vice versâ*. When these substances are crystallized, the means of distinguishing them are very simple; quartz (see figure 21) is striated transversely on the planes of the prism; beryl (fig. 22) is striated longitudinally; and by sacrificing one or two crystals, and observing the fracture, the truth may be ascertained. If emerald or beryl, the fracture will be in planes, like the slices in the Indian girdle, or the cleavage of topaz, already shown in figure 19; if quartz, the fracture will never be in a straight line, but conchoidal. Mr. A. Hope exhibited a fine transparent beryl, forming the hilt of a sword.

Shortly before the close of the Exhibition a precious opal in its

* This girdle is now in the possession of Her Majesty.

matrix, from Hungary, was shown in the Austrian department. This stone was remarkable for its varied colours, and attracted much notice. Several interesting specimens were also shown in the American department.

Many of the jewellers made a display of precious garnets, or carbuncles, in the various collections of precious stones. The crystalline form of garnet is that of a rhombic dodecahedron, fig. 16, and the same having all the edges replaced by six-sided planes as shown in fig. 15.

Tourmaline.—Only a few of these were shown. This mineral is more valuable for optical than ornamental purposes. Fig. 20 is one of its most common forms.

Many beautiful examples of artificial gems were exhibited, and it required an experienced eye to distinguish them from the real specimens. They may, however, in all cases, be readily distinguished by their inferior hardness, yielding readily to the file, or to a crystal of quartz.

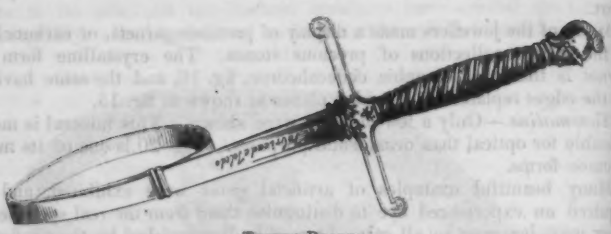
In conclusion, I desire to draw the attention of all persons likely to travel in foreign countries, especially to Australia, the Cape of Good Hope, India, and Canada, to the great importance of a knowledge of minerals. There is no country in the world possessing a wider range of territory or greater mineral wealth than Great Britain; consequently, there is none in which the study of mineralogy is more important; yet the ignorance which prevails on the subject is astonishing. I am frequently receiving packages and letters of inquiry from our colonies, containing pebbles of quartz and bits of shining iron pyrites, which a few simple experiments would render unnecessary. A very small amount of knowledge as to the method of testing minerals, especially as to their specific gravity, would save months of anxious suspense, which must occur while waiting a reply from England. But I am not without hope that the ignorance which leads to such mistakes as these will gradually be dispelled. The Great Exhibition afforded noble opportunities for the study and comparison of minerals: equal, if not greater, facilities are afforded by the collection in the British Museum,* which may be examined every Monday, Wednesday, and Friday; and I trust that the stimulus thus given to the study of mineralogy, as well as to that of almost every other branch of human knowledge, will not be allowed to die away, but will effectually arouse the nation to a sense of the great importance of Natural History in every scheme that may henceforth be devised for the public or private tuition of our people.

149 *Strand.* J. T.

* Specimens illustrating some of the general descriptions in this Lecture can be studied by referring to the following Cases in the Mineralogical Department:—Diamonds, Case 4; Corundum, including the coloured varieties known in Jewellery as Oriental Stones, viz., Sapphire, Ruby, Topaz, Amethyst, &c., Case 19; Chrysoberyl, 19; Spinel, 19; Topaz, 58A; Emerald and Beryl, 37; Opal, 24; Garnets, 36; Tourmaline, 40; Quartz, 20. And Jewels in a polished state, constituting the Crown Jewels, can be seen in the Tower of London, daily, for the small charge of sixpence.

*** At page 371, line 18, *for* 'plans' *read* 'planes.'

TOLEDO.



TOLEDO BLADE.

THE sword-blades and daggers of Toledo were anciently held in very high estimation, and even at the present time they are so famous for their temper, that the mode in which their fabrication is conducted cannot fail to be an interesting object of inquiry to the curious.

At all ages, the Toledans maintain, not only in the days of chivalry but at the time when Spain was occupied by the Romans, their city was celebrated for the temper and general excellence of its swords. After the expulsion of the Moors, the occupation of armourer was considered an honourable profession, and great privileges were bestowed on this corporation. It was not permitted every one who chose to exercise the calling. It was necessary to undergo certain examinations, to be passed master in the art, to have a spotless character for honesty and integrity. The grand master then delivered to the candidate a diploma, after which he was entitled to exercise the noble profession.

In the time of Nicholas Nortuno, Juan Martinez, Antonio Ruiz, Dionisio Corrientès, names great in the annals of Christian Toledo, and even now spelt out with great veneration on the rusty blades treasured up by the peaceable collectors of ancient armour.—In the time of these great names, many a trusty sword was prized which on the battle-field never disappointed its bearer; but when the invention of gunpowder changed the whole system of war, in vain did their successors manufacture swords of good temper—the sale of them was gone. The very cut was on the point of disappearing, when, about the year 1760, Charles III. resolved, in order to preserve it, to place the manufacture under the protection of the State.

In imitation of the old system, he established within the city a manufactory, situated on a steep precipice elevated two or three hundred feet above the Tagus; but, before long, he discovered that it would be far more desirable to transplant it to the banks of the river, in order that the water, so excellent in the process of tempering, might also serve to turn grinding and polishing mills, these operations having hitherto been performed by manual labour. Consequently, about a quarter of a league from the city, in the fine large plain which stretches to the north, he erected a building especially adapted to this purpose, which is still in existence. It contains workshops appropriated to the manufacture of the several parts of a sword-blade, hilt, scabbard, &c.

We shall describe here the process of making a sword-blade only, as being the most interesting. The workmen, distributed through eight

workshops containing each two forges, take two pieces of bar steel, measuring three or four inches in length, according to the destined size of the weapon on which they are engaged. Between these two pieces of steel they place a piece of iron of the same size previously wrought into a mass from old horseshoes. This old iron is peculiarly soft and malleable, owing, perhaps, to the immense number of little blows which the iron receives at each step of the horse, and perhaps to the peculiar method adopted by the Spanish farriers. Their system is very different from that pursued in this country, for instead of heating and reheating the iron again and again, they place it but once in the fire, and while it remains hot beat it into the rude shape of a horseshoe. After it has become cold, they begin again to beat with a small hammer for one turn or two, until the form is perfect and the shoe is almost polished from the effect of the blows. This operation is not carried on at the forges.

Near some city gate, in a street of much resort, your ear as you pass is assailed by the clattering of hammers on iron, falling in clear, regular cadences; you look, and under a thatched shed built against a wall, you see, at a stall for shoeing horses, mules, and asses, one, two, three, and sometimes four farriers, in their picturesque costume, with one hand dealing blows with their hammers, now on their little anvil, now on the iron, and with the other manœuvring the shoe in the most skilful manner, turning now this side, now that, and at every blow making it spring up into the air.

If a muleteer passes by with his troop, the cadence becomes more rapid and concentrated, and the bright iron dances more nimbly. But the eyes of the farriers never leave their work, and although they sing lustily all the while with the nasal twang of the country, there is no reason to find fault with the handiwork of these honest and proud Castilians. To return, however, to the swords.

The smiths then take two pieces of steel, and place between them one piece of soft iron as described, and having made the whole red hot, weld them together with repeated blows of the hammer, beating it out at the same time to the requisite length, and giving it something of its future shape. To heat the metal they make no use of coal, which they consider too ardent in its effects, nor even of ordinary charcoal, but employ only a kind of very light and soft charcoal made for the purpose, of the stems of heath, resembling perhaps our peat.

The forging finished, the blades are passed on to the tempering-shops. Of these there are two, with two furnaces and as many cisterns filled with the yellow water of the Tagus. The same charcoal which is used in the forges serves also to heat the blades which are to undergo the process of tempering. One man blows two pair of bellows, one with each hand to regulate the heat and make it continuous. The temperer, after having carefully straightened the iron in case it has been bent at all during the forging, thrusts it into the middle of the burning charcoal, holding it by a rude wooden handle. When it is slightly heated, he withdraws it and rubs both sides with soap; suddenly it becomes clear and bright, and the flaws in the iron, if there are any, show themselves. He then thrusts it again into the fire, moving it about all the while until it becomes red hot throughout its whole length. Near the furnace is a large trough filled with water from the Tagus, so famous for its tempering properties. When the blade has attained the necessary degree of heat between red and orange, he withdraws it and plunges it slowly and with a

certain amount of gravity, into the water, beginning with the point, and with the flat part downwards if it be a sword, with the back if a sabre. It is necessary that that part of the blade, the strength of which will be most severely tried, should first touch the water, in order that, since the contraction which the metal undergoes by the coldness of the water is there greater, the defects in the welding of the thinnest part may be more readily detected. Immediately after dipping, the blade is drawn out from the water and suspended for two or three minutes over a brazier of charcoal. This does not burn with a white heat, but a beautiful blue flame escapes through the pieces of charcoal, and its heat puts a finishing stroke to the temper.

From the tempering-shop the blade is passed on to that of the polisher's. The Tagus has a considerable fall in the immediate vicinity of Toledo, and is traversed by seven weirs, fifty feet apart, with mills, the wheels of which turn a dozen greyish-red grindstones placed in two shops. On these stones workmen grind the blades until they have attained the requisite shape and size, but without giving them a polish. They are then sent on to the proving-shop. Before a blade is considered perfect, it must undergo three several formidable trials. The first is the most serious: it is made by resting the blade on a kind of iron horse, with a plating of copper, and bending it down by the exercise of great pressure with one hand on each side of the horse. This trial is repeated at a great number of different places and on both sides; and after the blade has passed them all, it must remain perfectly straight, and without a flaw being apparent. If there is any defect in the welding, it will shiver like glass under the pressure. The second proof is called that of the lion's tongue. The trier holds the blade by the hilt, places the point against the tongue of a lion, made of lead, fixed in the wall, and bends it into the form of more than a semicircle. The curve must be regular, without any bulge, and the blade must recover its straightness instantly that it is released. The third is made by exerting the whole strength of the arm in a cutting blow at a block of iron, resting on a cushion stuffed with hay. The blade must notch the iron and pass the trial without the least flaw on the edge. Those which have stood all these tests are sent back to the polishing-shop to receive a polish, which is always given by means of wooden wheels covered with composition; the others are treated as old iron. Only ten or twelve per cent. are usually found among the former. After polishing, the blades are handed over to the engraver; they are then hilted, placed in scabbards, and finally consigned to the Spaniards, who, having no one to cleave in twain with their inimitable blades, use them to cut up their white cabbage, which they eat raw as salad.

Since this manufactory supplies not only swords and sabres, but poignards, lance-heads, and fencing-foils, both for home use and exportation, and as these various articles are manufactured in no fixed proportions, but to meet the existing demand, it is difficult to say what number is annually manufactured. It is, however, estimated at about seven or eight thousand pieces collectively—a number which might be doubled, or even trebled, if occasion required.